

their under surfaces, are seen passing from their centres of ossification.

In all these figures the same letters apply to the same bones. *mx*, maxilla; *mn*, mandible; *d*, dentary; *ag*, angular; *su.o*, sub-orbital; *x*, cheek-plate above the maxilla; *y*, portion of hyo-mandibular (?); *op*, operculum; *s.op*, suboperculum; *br*, branchiostegal plates or rays; *1st s.cl*, first supraclavicular; *2nd s.cl*, second supraclavicular; *cl*, clavicle; *i.cl*, interclavicular.

XXXI.—On a new Species of *Liphistius* (Schjödte).

By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

THE British-Museum collection contains a fine specimen of this remarkable genus from Penang, the same locality whence the typical species *L. desultor*, Schjödte*, was obtained. In almost every essential particular the British-Museum example agrees with *L. desultor*, except in being larger and possessing four mammillary organs of considerable size beneath the abdomen, immediately behind the second pair of spiracular apertures. Prof. Schjödte makes no mention of such organs, describing *L. desultor* as “mammillis textoriis nullis.” Whether the organs in the British-Museum specimen are, or not, true spinning-organs seems doubtful, inasmuch as an examination lately made under a microscope by Mr. A. G. Butler has failed to reveal any spinning-tubes.

It is not without some reluctance that I have determined to characterize the example in the British Museum as a new species. It appeared to me possible that the mammillary organs might have been overlooked or destroyed in the specimen from which Prof. Schjödte described *Liphistius desultor*; I am, however, compelled to shut out the idea of this possibility, after receiving a communication on the subject (through Dr. Thorell) from Prof. Schjödte. From this communication it appears that when the specimen came into Prof. Schjödte's hands it was in a dry state, having been opened along the middle line of the underside of the abdomen and, after extraction of the contents, stuffed with cotton; it was then placed in spirit of wine. Prof. Schjödte thinks it almost impossible for the collector (Dr. Teylingen, himself a good zoologist) to have overlooked or destroyed the mammillæ, if they had been present; the incision through the abdomen had the appearance of being exceedingly clean and even; and the surface showed no loss whatever of substance. Under these

* *Vide* description and figures of *Liphistius desultor*, in Kröyer's 'Naturhist. Tidsskr. N. R.' Bd. ii. 1849, pp. 617-624, tab. 4.

circumstances, the conclusion seems inevitable that the example possessing the four mammillary organs (and these placed in so abnormal a position), whatever may be their true nature and office, must be of a different species from that described by Prof. Schiödte.

I therefore propose to call the British-Museum example *Liphistius mammillanus*, and briefly to characterize it as follows:—

Liphistius mammillanus, n. sp.

Adult female, length 20 lines = 42 millims.

Abdomen similar in colour to that of *L. desultor* (Schiödte), and its upperside similarly covered by a longitudinal series of transverse articulated corneous plates. The spiracular plates are four in number, grouped closely together beneath the fore extremity of the abdomen (fig. 1, *b b b b*); and immediately behind them are four mammillary organs, placed two and two, as represented (fig. 1, *a a a a*); the two foremost are much larger than the two hinder ones, of a curved subconical or rather tapering form, composed of several (about twelve) articulations or rings, of which the basal one is much the largest; the two hinder organs are somewhat similar in form, though much smaller, and the basal annulation is not nearly so broad

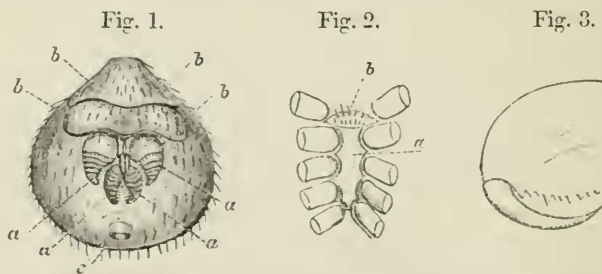


Fig. 1. Underside of abdomen: *a a a a*, mammillary organs; *b b b b*, spiracular plates; *c*, anal tubercle and orifice. Fig. 2. *a*, sternum; *b*, labium. Fig. 3. One of the falces.

in proportion; the several annulations are fringed with short hairs on their posterior edges. These organs are capable of vertical, but not horizontal movement. The anal aperture seems to be in rather a different position from that represented in Prof. Schiödte's plate (fig. 7), where it occupies the posterior extremity of the abdomen, while in the present spider it is placed considerably beneath it (fig. 1, *c*).

The *sternum* (fig. 2, *a*) differs a little in form from that of *Liphistius desultor*; while the *eyes* appear to be similar both

in their relative size and position. The *labium*, however, though similar in form, is distinctly broader than the fore extremity of the sternum (fig. 2, *b*); while in *L. desultor* it is represented in figure 5 of Schiödte's plate as narrower.

A single example of the adult female in the British Museum.
Hab. Penang.

Naturalists and collectors in Penang should endeavour to find other examples of this genus, of which all our knowledge at present is based upon the two specimens mentioned above. Besides the interest attaching to the presence or absence of spinners, they are the only spiders, as yet discovered, whose abdomen is protected by articulated corneous transverse plates, similar to those found in the orders Scorpionidea and Thelyphonidea.

XXXII.—*On the Geographical Distribution of Fishes.*

By THEODORE GILL, M.D., Ph.D.*

ABOUT 9000 species of living teleosteous fishes are now known, variously distributed and found in greater or less numbers in almost all the waters of the globe, fresh and salt; the greatest numbers of species, however, are found in the tropical waters, and especially in the seas of the Indo-Moluccan archipelago. The distribution of the types, especially of the marine species, to a considerable degree coincides with thermometrical conditions. In the polar and northern temperate regions, for example, are found representatives of the families of Gadoids or codfishes, Lycodoids, Stichæoids, Liparidoids, Cottoids or sculpins, and others less known. In the tropical regions many forms are distributed throughout the entire zone (and therefore designated as tropicopolitan), this being especially the case with many genera of Labroids, Scaroids or parrot-fishes, Pomacentroids, Gerreoids, Serranoids or groupers, Sparoids, Carangoids, and others—numerous species of these families being found in torrid waters, while very few extend far northward or southward. In the antarctic regions, again, we have another combination of forms: typical codfishes and the other types characteristic of high northern latitudes are wanting, but are severally replaced by peculiar groups, which seem to fill an analogous place in the economy of nature, having a superficial resemblance in general aspect, although they are not at all (comparatively speaking) related in structure.

* Reprinted, with additions by the Author, from advance sheets of 'Johnson's New Universal Cyclopædia.'